Claims:

Amend claims from 1 – 9.

Cancel claims from 10 – 23 and substitute new claims 24 – 37 as follows:

Claim 1 (currently amended): A dual-mode [[UWB]] ultra wideband and [[WLAN]] wireless local area network transceiver comprising:

a digital lowpass-shaping filter system coupled to a [[UWB]] ultra wideband multichannel [[PN]] pseudorandom noise sequence mapping or a ~~WLAN IFFT~~ wireless local area network inverse fast Fourier transform and [[I/Q]] image/quadrature modulation;

a dual-mode sampling frequency rate coupled to a digital-to-analog converter; and

a switch to connect from the [[UWB]] ultra wideband multichannel [[PN]] pseudorandom noise sequence mapping or the ~~WLAN IFFT~~ wireless local area network inverse fast Fourier transform and [[I/Q]] image/quadrature modulation to the digital lowpass-shaping filter system.

Claim 2 (currently amended): The dual-mode [[UWB]] ultra wideband and [[WLAN]] wireless local area network transceiver of claim 1 wherein said digital lowpass-shaping filter system can be controlled by using said switch to connect said [[UWB]] ultra wideband multichannel [[PN]] pseudorandom noise sequence mapping or said ~~WLAN IFFT~~ wireless local area network inverse fast Fourier transform and [[I/Q]] image/quadrature modulation.

Claim 3 (currently amended): The dual-mode [[UWB]] ultra wideband and [[WLAN]] wireless local area network

transceiver of claim 1 wherein said digital lowpass-shaping [[FIR]] finite impulse response filter system includes:

an indoor [[UWB]] ultra wideband digital [[FIR]] finite impulse response lowpass shaping filter;

an outdoor [[UWB]] ultra wideband digital [[FIR]] finite impulse response lowpass shaping filter;

an [[WLAN]] wireless local area network digital multistage [[FIR]] finite impulse response lowpass shaping filter; and

[[two]] controllable switches.

Claim 4 (currently amended): The dual-mode [[UWB]] ultra wideband and [[WLAN]] wireless local area network transceiver of claim 3 wherein said digital lowpass-shaping [[FIR]] finite impulse response filter system can select to use said indoor [[UWB]] ultra wideband digital [[FIR]] finite impulse response lowpass shaping filter or said outdoor UWB FIR ultra wideband finite impulse response lowpass shaping filter or said [[WLAN]] wireless local area network digital multistage [[FIR]] finite impulse response lowpass shaping filter by using said [[two]] controllable switches.

Claim 5 (currently amended): The dual-mode [[UWB]] ultra wideband and [[WLAN]] wireless local area network transceiver of claim 3 wherein said [[WLAN]] wireless local area network digital multistage [[FIR]] finite impulse response lowpass shaping filter comprises:

a first stage of upsampling by [[2]] M, where M is an integer, and a [[WLAN]] wireless local area network

digital [[12th]] Nth enlarged band lowpass shaping [[FIR]] finite impulse response filter; and

a second stage of upsampling by [[12]] N, where N is an integer, and a [[WLAN]] wireless local area network digital rejected lowpass [[FIR]] finite impulse response filter[[.]], where N is greater than M.

Claim 6 (currently amended): The dual-mode [[UWB]] ultra wideband and [[WLAN]] wireless local area network transceiver of claim 5 wherein said [[WLAN]] wireless local area network digital multistage [[FIR]] finite impulse response lowpass shaping filter is a two stage interpolation lowpass shaping [[FIR]] finite impulse response filter with upsampling of [[24]] MN, where M and N are integers.

Claim 7 (currently amended): The dual-mode [[UWB]] ultra wideband and [[WLAN]] wireless local area network transceiver of claim 1 wherein the dual-mode sampling frequency rate includes:

a [[UWB]] ultra wideband sampling frequency unit;

a [[WLAN]] wireless local area network sampling frequency unit;

a MUX unit; and

a selectable unit.

Claim 8 (currently amended): The dual-mode [[UWB]] ultra wideband and [[WLAN]] wireless local area network transceiver of claim 7 wherein said dual-mode sampling frequency rate can be controlled to select either one

sampling rate for the [[UWB]] ultra wideband mode or other sampling rate for the [[WLAN]] wireless local area network mode by using said MUX unit with said selectable unit.

Claim 9 (currently amended): The dual-mode [[UWB]] ultra wideband and [[WLAN]] wireless local area network transceiver of claim 1 wherein said only one digital-to-analog converter is needed for the dual-mode [[UWB]] ultra wideband and [[WLAN]] wireless local area network transmitter.

Claims 10-23 (canceled)

Claim 24 (new): A dual-mode ultra wideband and wireless local area network multichannel-based multi-carrier system comprising:

a digital-to-analog converter coupled to an analog lowpass filter that connected to a mixing;

the mixing coupled to a power amplifier;

a ultra wideband selectable multicarrier frequencies connected to a ultra wideband commuter unit in which contains a ultra wideband switch;

a wireless local area network lower-band selectable multicarrier frequencies coupled to a lower-band wireless local area network commuter unit in which contains a lower-band switch;

a wireless local area network upper-band selectable multicarrier frequencies coupled to a upper-band wireless local area network commuter unit in which contains a upper-band switch; and

a software control unit selects one of outputs from the ultra wideband commuter unit, the lower-band wireless local area network commuter unit or the upper-band wireless local area network commuter unit to the mixing by controlling MUX units.

Claim 25 (new): The dual-mode ultra wideband and wireless local area network multichannel-based multi-carrier system of claim 24 wherein said software control unit through controlling the ultra wideband switch, the lower-band switch, and the upper-band switch can select a carrier frequency during transmissions from said ultra wideband commuter unit, said lower-band wireless local area network commuter unit or said upper-band wireless local area network commuter unit.

Claim 26 (new): The dual-mode ultra wideband and wireless local area network multichannel-based multi-carrier system of claim 24 wherein said digital-to-analog converter coupled to said analog lowpass filter can be used for transmissions either in a ultra wideband mode or in a wireless local area network mode.

Claim 27 (new): The dual-mode ultra wideband and wireless local area network multichannel-based multi-carrier system of claim 24 wherein said digital-to-analog converter, said analog lowpass filter, said mixing, said power amplifier, said MUX units, said ultra wideband switch, said lower-band switch, and said upper-band switch are programmable and controllable by using said software control unit.

Claim 28 (new): A dual-mode ultra wideband and wireless local area network communication receiver comprising:

an analog-to-digital converter;

a pre-switch to provide information to a rake receiver or to an image/quadrature demodulation;

a digital receiver filter system to provide information to the pre-switch;

a post-switch to provide information to a block de-interleaver; and

a de-spreading of pseudorandom noise sequence and de-mapping or a fast Fourier transform mapping unit to provide information to the post-switch.

Claim 29 (new): The dual-mode ultra wideband and wireless local area network communication receiver of claim 28 wherein said analog-to-digital converter has B resolution bits, where B is an integer, and controllable sampling frequency rates.

Claim 30 (new): The dual-mode ultra wideband and wireless local area network communication receiver of claim 28 wherein said pre-switch is programmable to connect a position with said rake receiver during the ultra wideband mode or to connect a position with said image/quadrature demodulation during the wireless local area network mode.

Claim 31 (new): The dual-mode ultra wideband and wireless local area network communication receiver of claim 28 wherein said post-switch is programmable to connect a position with said de-spreading of pseudorandom noise

sequence and de-mapping during a ultra wideband receiver mode or to connect a position with said fast Fourier transform mapping during a wireless local area network receiver mode.

Claim 32 (new): An article comprising a medium for storing instructions that cause a digital signal processor-based dual-mode ultra wideband and wireless local area network communication system to:

Selectively set the sampling frequency rate for the digital-to-analog converter during the ultra wideband transmitter mode or during the wireless local area network transmitter mode;

Selectively set the connection with ultra wideband multichannel pseudorandom noise sequence mapping or the connection with wireless local area network image/quadrature modulation and inverse fast Fourier transform during the transmitter;

Selectively set the digital lowpass-shaping transmitter filter for the ultra wideband or for the wireless local area network during the transmitter;

Selectively set the use of the multicarrier of the ultra wideband or of the lower and upper wireless local area network during the transmitter;

Selectively set the connection with ultra wideband rake receiver or wireless local area network image/quadrature demodulation and fast Fourier transform; and

Selectively set the indoor ultra wideband digital finite impulse response lowpass shaping filter for the indoor ultra wideband operation or the outdoor ultra

wideband digital finite impulse response lowpass shaping filter for the outdoor ultra wideband operation.

Claim 33 (new): The article of claim 32 further storing instructions that cause a digital signal processor-based dual-mode ultra wideband and wireless local area network transmitter system to select either the ultra wideband sampling frequency rate for the digital-to-analog converter during the ultra wideband mode or the wireless local area network sampling frequency rate for the digital-to-analog converter during the wireless local area network mode.

Claim 34 (new): The article of claim 32 further storing instructions that cause the digital signal processor-based dual-mode ultra wideband and wireless local area network transmitter system to control the switches to connect with ultra wideband baseband functions of the multichannel pseudorandom noise sequence mapping during the ultra wideband mode or to connect with wireless local area network based functions of the wireless local area network inverse fast Fourier transform and image/quadrature modulation during the wireless local area network mode.

Claim 35 (new): The article of claim 32 further storing instructions that cause the digital signal processor-based dual-mode ultra wideband and wireless local area network transmitter system to control the switches to connect with the indoor ultra wideband transmitter filter or the outdoor ultra wideband transmitter filter or to

connect with the wireless local area network multistage transmitter filter.

Claim 36 (new): The article of claim 32 further storing instructions that cause the digital signal processor-based dual-mode ultra wideband and wireless local area network transmitter system to select the multicarrier frequencies during the ultra wideband mode or the wireless local area network mode.

Claim 37 (new): The article of claim 32 further storing instructions that cause a digital signal processor-based dual-mode ultra wideband and wireless local area network receiver system to control the switches to connect with the ultra wideband baseband functions of the rake receiver and de-spread of pseudorandom noise sequence and de-mapping during the ultra wideband mode or to connect with the wireless local area network based functions of the image/quadrature demodulation and mapping during the wireless local area network mode.